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10/591,688	09/05/2006	Keiko Yamamichi	295714US0PCT	4861

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EXAMINER	
SNYDER, ZACHARY J	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/591,688	Applicant(s) YAMAMICHI ET AL.	
	Examiner Zachary Snyder	Art Unit 2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *4,5,12 and 14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-3,6-11,13 and 15-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Receipt is acknowledged of applicant's amendment filed 4/3/2009. Claims 1-29 are pending and an action on the merits is as follows.

Claim Rejections - 35 USC § 103

Claims 1-3, 6-11, 13, and 15-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,030,553 B2 to Winters et al. in view of U.S. PG Publication 2003/0184688 A1 to Kim.

In regard to claim 1, Winters discloses (figure 3 for reference) an organic electroluminescent display comprising:

a substrate (substrate 100, COL. 4, LINES 53-54); and

a first organic electroluminescent device part (gamut subpixel 21c, COL. 4, LINE 15) and a second organic electroluminescent device part (gamut pixel 21b, COL. 4, LINE 15) placed side by side on a surface of the substrate (substrate 100, COL. 4, LINES 53-54);

the first organic electroluminescent device part (gamut subpixel 21c) including at least a light reflective conductive layer (reflector 150c; the teachings of figure 3 can be applied to passive matrix display (COL. 4, LINES 8-12) where a conductive material would be used as the reflector so it can function as an electrode (COL. 4, LINES 34-37)), an organic luminescent medium layer (organic EL media 210, COL. 7, LINE 23), and a transparent electrode layer (transparent electrode 240, COL. 7, LINE 45) in this order (shown in figure 3) and including a

light reflective layer (semi-transparent reflector 230, COL. 7, LINES 40-41) inside or outside of the organic luminescent medium layer or the transparent electrode layer;

the second organic electroluminescent device part (gamut pixel 21b) including at least a light reflective conductive layer (reflector 150b; the teachings of figure 3 can be applied to passive matrix display (COL. 4, LINES 8-12) where a conductive material would be used as the reflector so it can function as an electrode (COL. 4, LINES 34-37)), a first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66), an organic luminescent medium layer (organic EL media 210, COL. 7, LINE 23), and a transparent electrode layer (transparent electrode 240, COL. 7, LINE 45) in this order and including a light reflective layer (semi-transparent reflector 230, COL. 7, LINES 40-41) inside or outside of the organic luminescent medium layer or the transparent electrode layer; and

an emission spectrum of light from the first organic electroluminescent device part differing from an emission spectrum of light from the second organic electroluminescent device part (gamut subpixels 21c and 21b have the colors blue and green respectively, COL. 3, LINES 24-26).

Winters does not disclose that the first inorganic compound layer has been subjected to crystallization treatment.

Kim teaches a method for selectively etching an inorganic pixel layer to form areas of varying thickness wherein a first portion is a crystalline layer (layer 108b, figure 3b) and a second and third portion are amorphous (108a, figure 3b) so that the amorphous section is selectively etched away.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Winters and Kim before him or her, for the first inorganic compound of Winters to be subjected to a crystallization treatment as taught by Kim so that the inorganic compound can be selectively etched and form a pixel electrode of varying heights in a display device.

In regard to claim 2, Winters discloses (figure 3 for reference) an organic electroluminescent display comprising:

a substrate (substrate 100, COL. 4, LINES 53-54); and

a first organic electroluminescent device part (gamut subpixel 21b) and a second organic electroluminescent (gamut subpixel 21a) device part placed side by side on a surface of the substrate (shown in figure 3);

the first organic electroluminescent device part (gamut subpixel 21b) including at least a light reflective conductive layer (reflector 150b; the teachings of figure 3 can be applied to passive matrix display (COL. 4, LINES 8-12) where a conductive material would be used as the reflector so it can function as an electrode (COL. 4, LINES 34-37)), a first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66), an organic luminescent medium layer (organic EL media 210, COL. 7, LINE 23), and a transparent electrode layer (transparent electrode 240, COL. 7, LINE 45) in this order (shown in figure 3) and including a light reflective layer (semi-transparent reflector 230, COL. 7, LINES 40-41) inside or outside of the organic luminescent medium layer or the transparent electrode layer;

the second organic electroluminescent device part (gamut subpixel 21a) including at least a light reflective conductive layer (reflector 150a; the teachings of figure 3 can be applied to passive matrix display (COL. 4, LINES 8-12) where a conductive material would be used as the reflector so it can function as an electrode (COL. 4, LINES 34-37)), a first inorganic compound layer (transparent cavity-spacer layer 140a), a second inorganic compound layer (a second metal oxide layer can be formed above the reflector 150a and below the organic EL media layer, COL. 7, LINE 51-56), an organic luminescent medium layer (organic EL media 210, COL. 7, LINE 23), and a transparent electrode layer (transparent electrode 240, COL. 7, LINE 45) in this order (shown in figure 3) and including a light reflective layer (semi-transparent reflector 230, COL. 7, LINES 40-41) inside or outside of the organic luminescent medium layer or the transparent electrode layer; and

an emission spectrum of light from the first organic electroluminescent device part differing from an emission spectrum of light from the second organic electroluminescent device part (gamut subpixels 21a and 21b have the colors red and blue respectively, COL. 3, LINES 24-26).

Winters does not disclose that at least one of the first inorganic compound layer and second inorganic compound layer has been subjected to crystallization treatment.

Kim teaches a method for selectively etching an inorganic pixel layer to form areas of varying thickness wherein a first portion is a crystalline layer (layer 108b, figure 3b) and a second and third portion are amorphous (108a, figure 3b) so that the amorphous section is selectively etched away.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Winters and Kim before him or her, for the first inorganic compound of Winters to be subjected to a crystallization treatment as taught by Kim so that the inorganic compound can be selectively etched and form a pixel electrode of varying heights in a display device.

In regard to claim 3, Winters discloses (figure 3 for reference) an organic electroluminescent display comprising:

a substrate (substrate 100, COL. 4, LINES 53-54); and

a first organic electroluminescent device part, a second organic electroluminescent device part, and a third organic electroluminescent device part placed side by side on a single surface of the substrate (gamut subpixels 21(a, b, and c);

the first organic electroluminescent device part (gamut subpixel 21c) including at least a light reflective conductive layer (reflector 150c; the teachings of figure 3 can be applied to passive matrix display (COL. 4, LINES 8-12) where a conductive material would be used as the reflector so it can function as an electrode (COL. 4, LINES 34-37)), an organic luminescent medium layer (organic EL media 210, COL. 7, LINE 23), and a transparent electrode layer (transparent electrode 240, COL. 7, LINE 45) in this order and including a light reflective layer (semi-transparent reflector 230, COL. 7, LINES 40-41) inside or outside of the organic luminescent medium layer or the transparent electrode layer (shown in figure 3);

the second organic electroluminescent device part (gamut subpixel 21b) including at least a light reflective conductive layer (reflector 150b), a first inorganic compound layer (cavity-

spacer 140b), an organic luminescent medium layer (organic EL media 210), and a transparent electrode layer (transparent electrode 240) in this order and including a light reflective layer (semi-transparent reflector 230) inside or outside of the organic luminescent medium layer or the transparent electrode layer (shown figure 3);

the third organic electroluminescent device part (gamut subpixel 21a) including at least a light reflective conductive layer (reflector 150a), a first inorganic compound layer (cavity-spacer 140a), a second inorganic compound layer (a second metal oxide layer can be formed above the reflector 150a and below the organic EL media layer, COL. 7, LINE 51-56), an organic luminescent medium layer (organic EL media 210), and a transparent electrode layer (transparent electrode 240) in this order and including a light reflective layer (semi-transparent reflector 230) inside or outside of the organic luminescent medium layer or the transparent electrode layer; and

emission spectra of light from the first, second, and third organic electroluminescent device parts differing from one another (gamut subpixels 21a, 21b, and 21c have the colors red, blue, and green respectively, COL. 3, LINES 24-26).

Winters does not disclose that at least one of the first inorganic compound layer and second inorganic compound layer has been subjected to crystallization treatment.

Kim teaches a method for selectively etching an inorganic pixel layer to form areas of varying thickness wherein a first portion is a crystalline layer (layer 108b, figure 3b) and a second and third portion are amorphous (108a, figure 3b) so that the amorphous section is selectively etched away.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Winters and Kim before him or her, for the first inorganic compound

of Winters to be subjected to a crystallization treatment as taught by Kim so that the inorganic compound can be selectively etched and form a pixel electrode of varying heights in a display device.

In regard to claim 6, Winters in view of Kim teaches the limitations of claim 2 and Kim also teaches that the first inorganic compound layer and the second inorganic compound layer include an inorganic oxide (ITO, paragraph 27), and crystallinity of the first inorganic compound layer is higher than crystallinity of the second inorganic compound layer (one is amorphous and one is polycrystalline, paragraph 27). The motivation to combine is the same as discussed in regard to claim 2.

In regard to claim 7, Winters in view of Kim teaches the limitations of claim 6 and Kim also teaches that the first inorganic compound layer is crystalline, and the second inorganic compound layer is non-crystalline (one is amorphous and one is polycrystalline, paragraph 27). The motivation to combine is the same as discussed in regard to claim 2.

In regard to claim 8, Winters in view of Kim teaches the limitations of claim 6 and that at least one of the first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66) and the second inorganic compound layer includes an oxide of an element selected from the group consisting of In, Sn, Zn, Ce, Sm, Pr, Nb, Tb, Cd, Ga, Al, Mo, and W (ITO, COL. 6, LINE 37).

In regard to claim 9, Winters in view of Kim teaches the limitations of claim 6 and that at least one of the first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66) and the second inorganic compound layer includes an oxide of an element selected from the group consisting of In, Sn, and Zn (ITO, COL. 6, LINE 37).

In regard to claim 10, Winters in view of Kim teaches the limitations of claim 2 and that the light reflective conductive layer (reflector 150b, COL. 7, LINE 31) includes a metal selected from the group consisting of Al, Ag, Au, Pt, Cu, Mg, Cr, Mo, W, Ta, Nb, Li, Mn, Ca, Yb, Ti, Ir, Be, Hf, Eu, Sr, Ba, Cs, Na, and K, or an alloy containing at least one metal selected from the group (preferred materials are Ag, Au, or allows composed of one or both of these materials, COL. 4, LINES 28-30).

In regard to claim 11, Winters in view of Kim teaches the limitations of claim 2 and that the light reflective conductive layer (reflector 150b, COL. 7, LINE 31) includes one, or two or more metals selected from the group consisting of Al, Ag, Au, Pt, Cu, Mg, Cr, Mo, W, Ta, Nb, Li, Mn, Ca, Yb, Ti, Ir, Be, Hf, Eu, Sr, Ba, Cs, Na, and K, or an alloy containing at least one metal selected from the group (preferred materials are Ag, Au, allows it to be composed of one or both of these materials, COL. 4, LINES 28-30).

In regard to claim 13, Winters in view of Kim teaches the limitations of claim 2 and that the display further comprises a color filter (COL. 3, LINES 62-67).

In regard to claim 15, Winters in view of Kim teaches the limitations of claim 2 and Kim teaches that the method further comprises:

selecting, as a material of a second inorganic layer, a material that has a lower crystallinity than a crystallinity of a first inorganic compound layer (layer 108a is amorphous and layer 108b is polycrystalline); and that the layers are then wet etched (amorphous layer is etched using an etchant such as diluted oxalic acid, paragraph 50).

When forming the structure of Winters using the selective etching method taught by Kim, the second inorganic compound layer would be formed after forming the first inorganic compound layer. The motivation to combine is the same as discussed in regard to claim 2.

In regard to claim 16, Winters in view of Kim teaches the limitations of claim 1 and that at least one of the first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66) and the second inorganic compound layer includes an oxide of an element selected from the group consisting of In, Sn, Zn, Ce, Sm, Pr, Nb, Tb, Cd, Ga, Al, Mo, and W (ITO, COL. 6, LINE 37).

In regard to claim 17, Winters in view of Kim teaches the limitations of claim 1 and that at least one of the first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66) and the second inorganic compound layer includes an oxide of an element selected from the group consisting of In, Sn, and Zn (ITO, COL. 6, LINE 37).

In regard to claim 18, Winters in view of Kim teaches the limitations of claim 1 and that the light reflective conductive layer (reflector 150b, COL. 7, LINE 31) includes a metal selected from the group consisting of Al, Ag, Au, Pt, Cu, Mg, Cr, Mo, W, Ta, Nb, Li, Mn, Ca, Yb, Ti, Ir, Be, Hf, Eu, Sr, Ba, Cs, Na, and K, or an alloy containing at least one metal selected from the group (preferred materials are Ag, Au, or allows composed of one or both of these materials, COL. 4, LINES 28-30).

In regard to claim 19, Winters in view of Kim teaches the limitations of claim 1 and that the light reflective conductive layer (reflector 150b, COL. 7, LINE 31) includes one, or two or more metals selected from the group consisting of Al, Ag, Au, Pt, Cu, Mg, Cr, Mo, W, Ta, Nb, Li, Mn, Ca, Yb, Ti, Ir, Be, Hf, Eu, Sr, Ba, Cs, Na, and K, or an alloy containing at least one metal selected from the group (preferred materials are Ag, Au, allows it to be composed of one or both of these materials, COL. 4, LINES 28-30).

In regard to claim 20, Winters in view of Kim teaches the limitations of claim 1 and that the display further comprises a color filter (COL. 3, LINES 62-67).

In regard to claim 21, Winters in view of Kim teaches the limitations of claim 1, and Kim also teaches a method of selectively etching that comprises:

selecting, as a material of a first inorganic layer, a material that is easily etched more than a conductive layer (amorphous film 108a is etched more easily than the electrode 108b that is polycrystalline, paragraph 27) and that these layers are wet etched (amorphous layer is etched

using an etchant such as diluted oxalic acid, paragraph 50) to achieve the desired shape where the polycrystalline layer is left behind while the amorphous layer is etched away.

When forming the structure of Winters using the selective etching method taught by Kim, the first inorganic compound layer would be formed after forming the electrode than is the light reflective conductive layer. The motivation to combine is the same as discussed in regard to claim 2.

In regard to claim 22, Winters in view of Kim teaches the limitations of claim 3 and Kim also teaches that the first inorganic compound layer and the second inorganic compound layer include an inorganic oxide (ITO, paragraph 27), and crystallinity of the first inorganic compound layer is higher than crystallinity of the second inorganic compound layer (one is amorphous and one is polycrystalline, paragraph 27). The motivation to combine is the same as discussed in regard to claim 2.

In regard to claim 23, Winters in view of Kim teaches the limitations of claim 22 and Kim also teaches that the first inorganic compound layer is crystalline, and the second inorganic compound layer is non-crystalline (one is amorphous and one is polycrystalline, paragraph 27). The motivation to combine is the same as discussed in regard to claim 2.

In regard to claim 24, Winters in view of Kim teaches the limitations of claim 22 and that at least one of the first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66) and the second inorganic compound layer includes an oxide of an element selected

from the group consisting of In, Sn, Zn, Ce, Sm, Pr, Nb, Tb, Cd, Ga, Al, Mo, and W (ITO, COL. 6, LINE 37).

In regard to claim 25, Winters in view of Kim teaches the limitations of claim 22 and that at least one of the first inorganic compound layer (transparent cavity-spacer layer 140b, COL. 5, LINE 66) and the second inorganic compound layer includes an oxide of an element selected from the group consisting of In, Sn, and Zn (ITO, COL. 6, LINE 37).

In regard to claim 26, Winters in view of Kim teaches the limitations of claim 3 and that the light reflective conductive layer (reflector 150b, COL. 7, LINE 31) includes a metal selected from the group consisting of Al, Ag, Au, Pt, Cu, Mg, Cr, Mo, W, Ta, Nb, Li, Mn, Ca, Yb, Ti, Ir, Be, Hf, Eu, Sr, Ba, Cs, Na, and K, or an alloy containing at least one metal selected from the group (preferred materials are Ag, Au, or allows composed of one or both of these materials, COL. 4, LINES 28-30).

In regard to claim 27, Winters in view of Kim teaches the limitations of claim 3 and that the light reflective conductive layer (reflector 150b, COL. 7, LINE 31) includes one, or two or more metals selected from the group consisting of Al, Ag, Au, Pt, Cu, Mg, Cr, Mo, W, Ta, Nb, Li, Mn, Ca, Yb, Ti, Ir, Be, Hf, Eu, Sr, Ba, Cs, Na, and K, or an alloy containing at least one metal selected from the group (preferred materials are Ag, Au, allows it to be composed of one or both of these materials, COL. 4, LINES 28-30).

In regard to claim 28, Winters in view of Kim teaches the limitations of claim 3 and that the display further comprises a color filter (COL. 3, LINES 62-67).

In regard to claim 29, Winters in view of Kim teaches the limitations of claim 3 and Kim teaches that the method further comprises:

selecting, as a material of a second inorganic layer, a material that has a lower crystallinity than a crystallinity of a first inorganic compound layer (layer 108a is amorphous and layer 108b is polycrystalline); and that the layers are then wet etched (amorphous layer is etched using an etchant such as diluted oxalic acid, paragraph 50).

When forming the structure of Winters using the selective etching method taught by Kim, the second inorganic compound layer would be formed after forming the first inorganic compound layer. The motivation to combine is the same as discussed in regard to claim 2.

Response to Arguments

Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Snyder whose telephone number is (571)270-5291. The examiner can normally be reached on Monday through Thursday, 7:30AM to 6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karabi Guharay/
Primary Examiner, Art Unit 2889

/Zachary Snyder/
Examiner, Art Unit 2889